Manufacturing Industry

Credit Rating Methods and Models

(PJFM-ZZ-2024-V1.0)

安融(香港)信用評級有限公司

ANRONG(HONG KONG)CREDIT RATINGS COMPANY LIMITED

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This document is translated from the Rating Methodology for Sovereign published on November 28, 2024. In case of any discrepancies or inconsistencies between the English and Chinese versions, the English version shall prevail.

Rating Methodology

Release Date

November 28, 2024

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I. Overview

Anrong (Hong Kong) Credit Rating Company Limited (ARHK) has developed the "Manufacturing Industry Credit Rating Methods and Models (PJFM-ZZ-2024-V1.0)" (referred to as "this methodology and model") to improve the consistency, accuracy, and stability of rating methods and models and rating results, in accordance with relevant laws and regulations and ARHK's related management system regulations.

This methodology and model determines the rated entity's rating benchmark by combining sovereign risk adjustment factors, and the rating benchmark is combined with internal adjustment factors to derive the rated entity's BCA grade. The BCA grade combined with external support results in the final credit rating of the rated entity. Specifically, ARHK constructs the "Regional Strength and Industry Risk" dimension based on a full consideration of the macro and regional strength and industry risk of manufacturing enterprises. Then, it constructs the "Operational and Financial Risk" dimension based on a full consideration of the corporation's strength and operational risk, solvency, corporate financial risk, and corporate profitability. The Pre-SRAF rating level of the rated entity is obtained through a two-dimensional matrix mapping of "Regional Strength and Industry Risk" and "Operational and Financial Risk". The rating benchmark of the rated entity is determined by combining sovereign risk adjustment factors, and the BCA grade is derived by combining self-adjustment factors. Finally, external support is considered to obtain the rated entity's credit rating (Model Result Grade).

In terms of grade symbols, the BCA grade is represented by a sequence of symbols from "aaa" to "c". Except for "aaa" and grades below "cc" (inclusive), each credit grade can be adjusted slightly with "+" or "-" symbols, indicating that the credit level is slightly higher or lower than the current level. The final credit grade symbols correspond to a sequence from "AAA" to "C". Except for "AAA" and grades below "CC" (inclusive), each credit grade can be adjusted slightly with "+" or "-" symbols, indicating that the credit level is slightly higher or lower than the current level.

This methodology and model becomes effective from the date of announcement.

II. Scope of Application

ARHK defines the criteria for rated entities in the manufacturing industry as follows:

(1) The rated entity's business scope is mainly in the manufacturing industry.

(2) The rated entity's income or profit mainly comes from the manufacturing business.

(3) If the above two conditions are not met, but after a comprehensive examination of the evaluated entity's business model, asset structure, income, and profit structure, it is determined that the entity clearly aligns with the characteristics of the manufacturing industry, we will also classify it as a manufacturing corporate.

III. Basic Assumptions

1. Assumption of Stability in Debt Repayment Environment

ARHK assumes that the macroeconomic environment, industry competition environment, regulatory environment, legal environment, and financial market environment will not undergo unexpected changes, such as natural disasters, wars, or other irresistible factors.

2. Assumption of Operational Stability

ARHK assumes that the rated entity is in a stable and continuous operational state, with coherent operational and financial data. Historical data can be used as a basis for predicting future operations. In the foreseeable future, there will be no significant changes in the rated entity's ability to continue operations due to changes in the macroeconomic environment, industry competition environment, regulatory environment, legal environment, and financial market environment. There will be no sudden operational changes or major unforeseen changes that have not been disclosed in advance. These changes include, but are not limited to, sudden changes in the nature of the rated entity, mergers and acquisitions, debt restructuring, major asset changes, significant regulatory penalties, defaults, bankruptcies, and other major negative events.

3. Assumption of Data Authenticity

ARHK assumes that data obtained from public authoritative channels and data provided by the rated entity (including, but not limited to, data compiled by the rated entity, data issued by third-

party intermediary institutions commissioned by the rating object, and data issued by other regulatory-recognized professional institutions for the rating object) are all true, legal, complete, and effective, without malicious embellishment or forgery, and without major misleading statements.

4. Assumption of No Difference in Debt Repayment Willingness

ARHK assumes that the rated entity has the same willingness to repay its similar debts and has not set a repayment order for similar debts.

IV. Credit Risk Characteristics

ARHK considers that the credit risks of manufacturing enterprises mainly include the following six aspects:

1. Cyclical Fluctuation Risk

The cyclical fluctuation risk of manufacturing enterprises refers to the risk caused by the impact of cyclical changes in the macroeconomic environment on the enterprise's operations. This risk mainly arises from fluctuations in the economic cycle, including both expansion and contraction phases.

During the economic expansion phase, market demand increases, and the enterprise's sales revenue and profits usually grow accordingly. However, when the economy enters the contraction phase, market demand decreases, and the enterprise's sales revenue and profits may decline significantly. This cyclical fluctuation may lead to operational instability for the enterprise, even risking losses or bankruptcy.

2. Concentration Risk

The concentration risk of manufacturing enterprises mainly arises from the enterprise's excessive reliance on a few customers or products. When these customers are lost or product demand declines, the enterprise's sales revenue and profits may fluctuate significantly, adversely affecting the enterprise's operational stability. If severe, this risk may seriously impact the enterprise's profitability, even threatening its survival and development. To mitigate this risk, enterprises can take measures such as optimizing sales strategies, actively developing new

customers, expanding the customer base, reducing reliance on a few customers; implementing product diversification strategies, launching diverse products, reducing reliance on a few products; strengthening supplier management, establishing cooperative relationships with multiple suppliers to ensure the stability and flexibility of the supply chain.

3. Business Transformation Risk

The business transformation risk of manufacturing enterprises refers to the risk faced by enterprises when changing their business model, product, or service direction. This risk arises from various factors, including changes in market demand, technological advancements, competitive pressures, regulatory policy adjustments, and more.

During the business transformation process, manufacturing enterprises may encounter a series of challenges and risks, such as the new business model, product, or service may not be accepted by the market, leading to transformation failure; the new business may require new technological support, and these technologies may be immature or risky; the transformation may require enterprises to reallocate human resources, but employees may not adapt to the new business model, leading to talent loss; the transformation may require significant capital investment, but short-term returns may not be achievable, leading to financial difficulties for the enterprise; the new business model may face legal and policy restrictions or uncertainties, among others.

4. Business Interruption Risk

Manufacturing enterprises may face business interruption risk due to business halts or interruptions. This risk may arise from the following aspects:

Changes in market demand may cause the enterprise to be unable to continue providing products or services that meet consumer needs, leading to business halts or interruptions; intensified market competition may cause the enterprise to be unable to compete with rivals, leading to business halts or interruptions; the technology relied upon by the enterprise may encounter issues or lag behind market demands, causing the enterprise to be unable to continue providing products or services that meet market needs, leading to business halts or interruptions; the enterprise's financial situation may encounter problems, such as capital shortages and excessive debt, causing the enterprise to be unable to maintain normal business operations, leading to

business halts or interruptions; the enterprise may face legal issues such as lawsuits or regulatory penalties, leading to business halts or interruptions.

5. Policy Risk

Manufacturing enterprises' production and operations are often influenced by national policy directions. The policy factors affecting manufacturing enterprises mainly include industrial policies, tax policies, and technical trade barriers. Changes in industry policies can have a significant impact on the supply and demand of manufacturing enterprises' products, product prices, and development directions. For example, changes in tariffs, value-added tax, and consumption tax rates will have a certain impact on the profitability of manufacturing enterprises; restrictive, supportive, and encouraging industry policies will guide and adjust the business direction of manufacturing enterprises; export tax rebates, import restrictions, special operations in free trade zones, and the Belt and Road Initiative will have a significant impact on manufacturing enterprises.

6. Commercial Foreign Exchange Risk

Commercial foreign exchange risk refers to the possibility of an enterprise losing expected benefits or suffering losses due to exchange rate fluctuations between one country or trading partner countries. Manufacturing enterprises engaged in international operations, payments, and settlements will bear the risk of exchange rate fluctuations, mainly including transaction risks caused by exchange rate changes during international trade, translation risks caused by changes in the value of certain foreign exchange items in the balance sheet due to exchange rate changes, and operational risks caused by exchange rate changes affecting future earnings.

V. Rating Methodology and Model Framework

"Regional strength and industry risk" reflects the operating environment, operating conditions, development space, and existing risks of manufacturing enterprises. "Operational and financial risk" reflects the ability of manufacturing enterprises to utilize their functions, assets, and financing environment and the risks involved.

ARHK constructs the rating methods and model path for manufacturing enterprises as follows:

Step 1: Establish an evaluation indicator system, defining the names, meanings, scoring, and weighting of evaluation indicators.

Step 2: Determine the grades for "Regional Strength and Industry Risk" and "Operational and Financial Risk".

Step 3: Based on the grades from the two dimensions, determine the Pre-SRAF rating grade for the rated entity using a two-dimensional matrix.

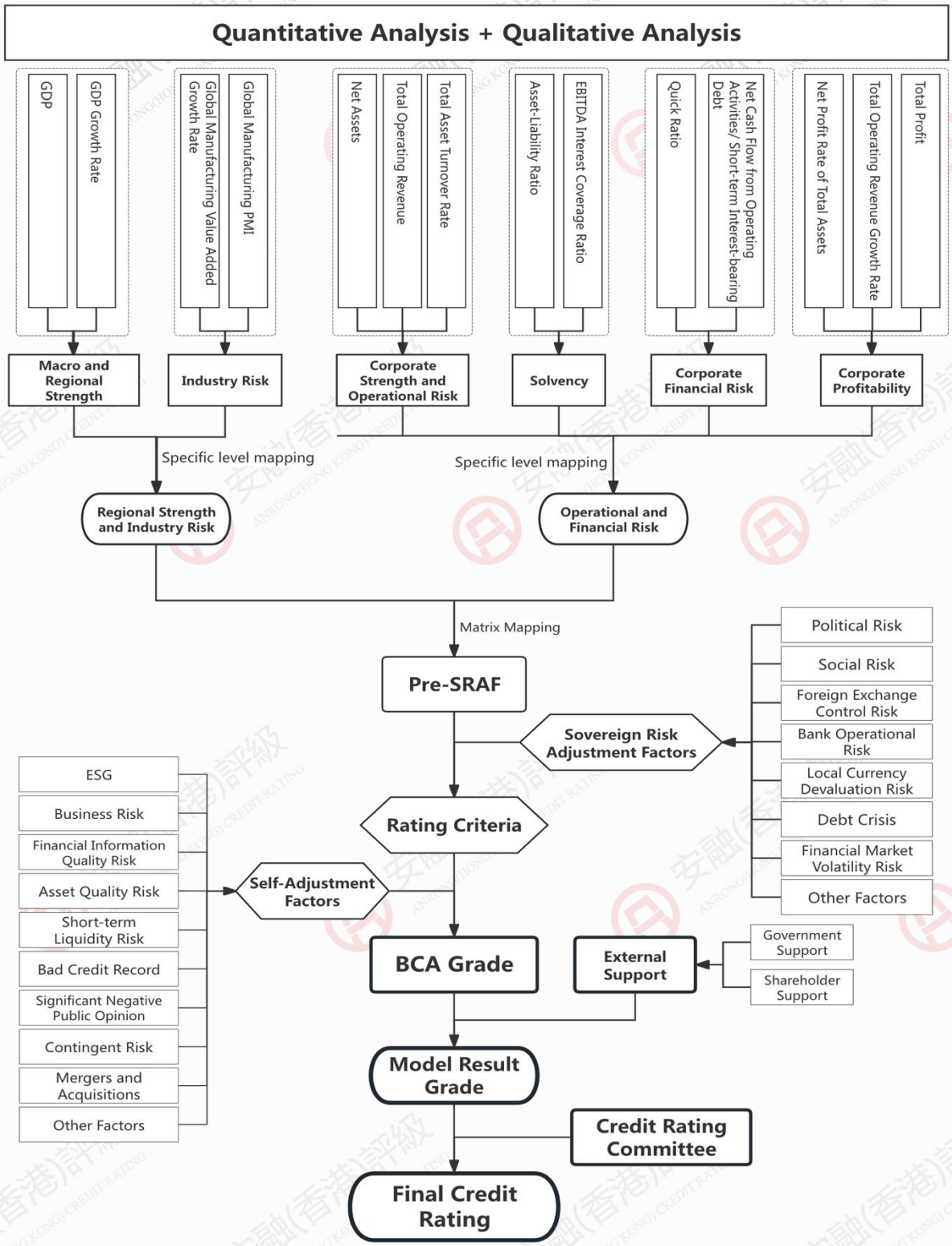
Step 4: Combine sovereign risk adjustment factors to determine the rated entity's rating benchmark.

Step 5: Combine internal adjustment factors to derive the rated entity's BCA grade.

Step 6: Consider external support comprehensively to obtain the rated entity's credit rating (Model Result Grade).

Considering that the “three-tier, nine-grade system” is widely used in the rating industry both domestically and internationally, where “three-tier” refers to “A”, “B”, and “C”, and “nine-grade” refers to “AAA”, “AA”, “A”, “BBB”, “BB”, “B”, “CCC”, “CC”, “C”, and considering that the difference in default probabilities among “CCC”, “CC”, and “C” is not significant, mainly reflected in differences in loss given default (LGD) which is not the focus of ARHK' assessments and forecasts, ARHK combines “CCC”, “CC”, and “C” into one grade when setting evaluation indicators and grades. Except for external support indicators and dimensions, which are set to three grades, all other indicators and dimensions are set to seven grades. Additionally, the symbol “D” (determined by the Credit Rating Committee) is used to indicate that the rated entity is unable to fulfill its obligations, and default is confirmed.

Grade Meanings: Grades range from the lowest (Grade 1) to the highest (Grade 7, or Grade 3 if only three grades are used). Higher grades indicate a more positive assessment and forecast of the rated entity's debt repayment ability and willingness.


Quantitative Analysis + Qualitative Analysis
GDP
GDP Growth Rate
Global Manufacturing Value Added Growth Rate
Global Manufacturing PMI
Net Assets
Total Operating Revenue
Total Asset Turnover Rate
Asset-Liability Ratio
EBITDA Interest Coverage Ratio
Quick Ratio
Net Cash Flow from Operating Activities/ Short-term Interest-bearing Debt
Net Profit Rate of Total Assets
Total Operating Revenue Growth Rate
Total Profit
Macro and Regional Strength
Industry Risk
Corporate Strength and Operational Risk
Solvency
Corporate Financial Risk
Corporate Profitability
Specific level mapping
Specific level mapping
Regional Strength and Industry Risk
Operational and Financial Risk
Matrix Mapping
Pre-SRAF
Sovereign Risk Adjustment Factors
Political Risk
Social Risk
Foreign Exchange Control Risk
Bank Operational Risk
Local Currency Devaluation Risk
Debt Crisis
Financial Market Volatility Risk
Other Factors
Rating Criteria
Self-Adjustment Factors
ESG
Business Risk
Financial Information Quality Risk
Asset Quality Risk
Short-term Liquidity Risk
Bad Credit Record
Significant Negative Public Opinion
Contingent Risk
Mergers and Acquisitions
Other Factors
BCA Grade
External Support
Government Support
Shareholder Support
Model Result Grade
Credit Rating Committee
Final Credit Rating

1. Pre-SRAF Rating Levels

ARHK analyzes "Regional Strength and Industry Risk" mainly from two factors, which are “macro and regional strength” and “industry risk”. And for "Operational and Financial risk”, the analysis mainly focuses on four factors, which are corporate strength and operational risk, solvency, corporate financial risk, and corporate profitability. A total of fourteen indicators are set, each with corresponding weights. Each indicator is divided into seven levels, and the Pre-SRAF rating level of the rated entity is determined using a two-dimensional matrix mapping table.

(1) Regional Strength and Industry Risk

Primary Indicator	Secondary Indicator	Tertiary Indicator
Regional Strength and Industry Risk	Macro and Regional Strength	GDP
		GDP Growth Rate
	Industry Risk	Global Manufacturing Value Added Growth Rate
		Global Manufacturing PMI

A. Macro and Regional Strength

The macroeconomic environment is closely related to the operation and development of manufacturing enterprises. Generally, the macroeconomic development cycle and trend, government policies, interest rates, exchange rates, investment and financing, and the economic operation of the global or relevant regions are closely related to the market demand, raw material prices, and profitability of manufacturing enterprises, which in turn have a significant impact on the enterprise's operating conditions. A good macroeconomic development trend is conducive to the stable and healthy development of manufacturing enterprises. Encouraging and preferential trade policies, protective and supportive industrial policies, active fiscal policies, loose and stable monetary policies, and appropriate interest rate levels will create a favorable policy environment for the development of manufacturing enterprises.

The operating capacity and asset quality of manufacturing enterprises are closely related to the economic development status of the regions where their business is mainly conducted. A good regional economic environment is beneficial to the operation of local manufacturing enterprises.

ARHK mainly examines the operating environment's regional strength of the rated entity from two dimensions: GDP and GDP growth rate.

Generally, the GDP indicator refers to the GDP value of the rated entity's registered location/business main area. The higher the indicator value, the better the regional economic development status, the stronger the motivation for local economic development, the better the development of the real economy and financial markets, which is conducive to the aggregation of capital and information, talent resource reserves, advanced technology cultivation, and infrastructure investment. At the same time, the stronger the regional economic competitiveness, the more conducive it is for manufacturing enterprises to expand their scale, optimize and adjust their internal industry and product structure, and improve production efficiency. The operational conditions of manufacturing enterprises are often better, and the credit risk is lower. Under normal circumstances, ARHK assigns higher ratings to manufacturing enterprises in regions with higher GDP.

The GDP growth rate refers to the GDP growth rate of the manufacturing enterprise's registered location/business main area. The GDP growth rate is an important consideration factor for the growth potential of manufacturing enterprises. The capital increment and profitability of manufacturing enterprises are closely related to the economic growth of their operating regions. Enterprises in regions with higher GDP growth rates are more active, their business activities are more frequent, and manufacturing enterprises have stronger business growth momentum. Therefore, ARHK assigns higher ratings to manufacturing enterprises in regions with higher GDP growth rates.

B. Industry Risk

The industry risks of manufacturing enterprises can be analyzed from the overall scale and trend of assets and profits, the total supply and demand of all industries, the growth rate of global manufacturing value-added, and the global manufacturing PMI. In this methodology and model, ARHK mainly examines the industry risks of the rated entities from the global manufacturing value added growth rate and the global manufacturing PMI.

The global manufacturing value added growth rate is an important indicator to measure the overall development status and growth momentum of the manufacturing industry. The level of this indicator not only reflects the growth status of the manufacturing industry itself but also indirectly reflects the growth momentum of the global economy. Generally, when the global economy is in a boom period, the manufacturing industry, as an important part of the real economy, usually maintains a high level of value-added growth rate. And when the global economy faces downward pressure, the growth of the manufacturing industry may also be affected to a certain extent. Therefore, ARHK assigns higher ratings to higher global manufacturing value-added growth rates.

The global manufacturing PMI is an important indicator to measure the intensity and trend of global manufacturing economic activity. Specifically, the global manufacturing PMI collects data on production, orders, inventory, prices, and employment from purchasing managers in the manufacturing industry worldwide to measure the overall status and development trend of the manufacturing industry.

The global manufacturing PMI, officially known as the Purchasing Managers' Index for the Global Manufacturing Sector, is a comprehensive indicator reflecting the overall operational status of the global manufacturing industry through a survey of purchasing managers of manufacturing enterprises worldwide. The higher the global manufacturing PMI index, the stronger the economic activity of the global manufacturing industry, the stronger the economic vitality, the higher the confidence of enterprises, the more robust the market demand, and the more stimulated investment and consumption activities. Therefore, ARHK assigns higher ratings to higher global manufacturing PMI rates.

The specific mapping standards for ARHK's "Regional Strength and Industry Risk" are as follows:

Indicator	7	6	5	4	3	2	1
GDP (100 million)	≥6000	[3000,6000)	[1000,3000)	[300,1000)	[100,300)	[50,100)	<50
GDP Growth Rate (%)	≥7	[5,7)	[3,5)	[1,3)	[0,1)	[-1,0)	<-1

Indicator	7	6	5	4	3	2	1
Global Manufacturing Value Added Growth Rate (%)	≥7.5	[5,7.5)	[2.5,5)	[0,2.5)	[-2.5,0)	[-5,-2.5)	<-5
Global Manufacturing PMI (%)	≥65	[60,65)	[55,60)	[45,55)	[40,45)	[35,40)	<35

Note: In the table above, when the GDP (100 million) indicator is converted to US dollars, all relevant RMB data is divided by the foreign exchange conversion rate (USD/RMB=7.0827) on December 29, 2023, which is authorized by the People's Bank of China (central bank) and published by the China Foreign Exchange Trade System, designated by the State Administration of Foreign Exchange as the foreign exchange conversion rate.

(2) Operational and Financial Risk

Primary Indicator	Secondary Indicator	Tertiary Indicator
Operational and Financial Risk	Corporate Strength and Operational Risk	Net Assets
		Total Operating Revenue
		Total Asset Turnover Rate
	Solvency	Asset-Liability Ratio
		EBITDA Interest Coverage Ratio
	Corporate Financial Risk	Quick Ratio
		Net Cash Flow from Operating Activities/ Short-term Interest-bearing Debt
	Corporate Profitability	Net Profit Rate of Total Assets
		Total Operating Revenue Growth Rate
		Total Profit

A. Corporate Strength and Operational Risk

The strength and operational risks of manufacturing enterprises can be analyzed from business scope, customer resources, economies of scale, risk control, and regional advantages. In this rating methodology and model, ARHK measures the strength and operational risks of manufacturing enterprises mainly through net assets, total operating revenue, and total asset turnover rate.

Net assets are an important consideration for the capital strength and financial robustness of manufacturing enterprises. Generally, manufacturing enterprises with larger net assets have a wider business coverage, relatively better customer quality, stronger bargaining power with upstream and downstream, better asset-liability management, operational stability, and repayment ability, thus possessing a stronger competitive advantage. Therefore, ARHK assigns higher ratings to manufacturing enterprises with larger net assets.

Total operating revenue is the return obtained by manufacturing enterprises for providing products and services, representing the scale and business operation results of the enterprise, and is also the basis for its cash flow and profits. Generally, the larger the total operating revenue, the stronger the comprehensive strength of the manufacturing enterprise, and the lower the credit risk. Therefore, ARHK assigns higher ratings to manufacturing enterprises with larger total operating revenue.

The total asset turnover rate is an indicator to measure the ratio between asset investment scale and sales level. The higher the total asset turnover rate, the stronger the enterprise's sales ability, the better the efficiency of asset investment, the stronger the short-term debt repayment ability, and the lower the credit risk. Therefore, ARHK assigns higher ratings to manufacturing enterprises with higher total asset turnover rates.

B. Solvency

Solvency refers to the ability of an enterprise to repay long-term and short-term debts with its assets. The solvency of manufacturing enterprises can be analyzed from the asset-liability ratio, the scale and term structure of interest-bearing debt, cash flow and stability, financial leverage level, ability to generate cash, and asset quality. In this rating methodology and model, ARHK measures the solvency of manufacturing enterprises mainly through the asset-liability ratio and EBITDA interest coverage ratio.

The asset-liability ratio is an important indicator to measure the level of debt and solvency of an enterprise, reflecting the leverage level and the degree of protection of creditors' interests during liquidation, and is also an important factor in measuring the level of debt and risk of manufacturing enterprises. Generally, the lower the asset-liability ratio indicator value, the lower

the financial leverage level of the manufacturing enterprise, the lighter of financial burden, and the lower credit risk. Therefore, ARHK assigns higher ratings to manufacturing enterprises with lower asset-liability ratios.

The EBITDA interest coverage ratio measures the ability of an enterprise to repay debt interest with earnings before interest, taxes, depreciation, and amortization. Generally, the higher the EBITDA interest coverage ratio indicator value, the better the financial flexibility, the stronger the solvency, and the lower the credit risk. Therefore, ARHK assigns higher ratings to manufacturing enterprises with larger EBITDA interest coverage ratios.

C. Corporate Financial Risk

The financial risks of manufacturing enterprises can be analyzed from the leverage level, business turnover efficiency, net profit margin, and the coverage of operating net cash flow, EBITDA, quick ratio, and monetary funds to the company's interest-bearing debt. In this rating methodology and model, ARHK measures the financial risks of manufacturing enterprises mainly through the quick ratio and the net cash flow from operating activities/short-term interest-bearing debt.

The quick ratio is an important indicator to measure the short-term debt repayment ability of an enterprise. Generally, the inventory backlog of manufacturing enterprises can reflect the short-term operating conditions and cash flow status of the enterprise. The quick ratio, excluding inventory, better reflects the industry characteristics of its liquid assets. The higher the quick ratio indicator value, the stronger the short-term debt repayment ability, and the lower the credit risk. Therefore, ARHK assigns higher ratings to manufacturing enterprises with higher quick ratios.

The net cash flow from operating activities/short-term interest-bearing debt reflects the coverage ability of operating net cash flow to short-term interest-bearing debt. Generally, the higher the net cash flow from operating activities/short-term interest-bearing debt indicator value, the stronger the guarantee ability of the manufacturing enterprise's operating net cash flow to short-term interest-bearing debt, and the smaller the short-term rigid payment pressure. Therefore,

ARHK assigns higher ratings to manufacturing enterprises with higher net cash flow from operating activities/short-term interest-bearing debt.

D. Corporate Profitability

The profitability of manufacturing enterprises can be analyzed from the operating revenue, operating costs, profit levels, operating profit margin, and return on investment. In this rating methodology and model, ARHK measures the profitability of manufacturing enterprises mainly through the net profit rate of total assets, total operating revenue growth rate, and total profit.

The net profit rate of total assets is a measure of the profit level obtained by the enterprise using all assets. Generally, the higher the net profit rate of total assets indicator value, the higher the input-output level of the manufacturing enterprise, the better the asset operation efficiency, the stronger the cost period expense control ability and risk control ability, and the lower the credit risk. Therefore, ARHK assigns higher ratings to manufacturing enterprises with larger net profit rate of total assets.

The total operating revenue growth rate is an important indicator reflecting the growth status and development ability of manufacturing enterprises. The higher the total operating revenue growth rate, the stronger the business growth of the manufacturing enterprise, the stronger the pricing ability and risk management ability. Therefore, ARHK assigns higher ratings to manufacturing enterprises with higher total operating revenue growth rates.

The total profit is the financial result achieved by the enterprise through production and operation activities within a certain period and is a very important economic indicator to measure the business performance of the enterprise. The larger the total profit, the better the business performance of the enterprise, the stronger the profitability, and the lower the credit risk. Therefore, ARHK assigns higher ratings to manufacturing enterprises with larger total profits.

The specific mapping standards for ARHK's "Operational and Financial Risks" are as follows:

Indicator	7	6	5	4	3	2	1
Net Assets (100 million)	≥2000	[700,2000)	[350,700)	[100,350)	[50,100)	[25,50)	<25
Total Operating	≥2000	[1100,2000)	[500,1100)	[100,500)	[15,100)	[1,15)	<1

Revenue (100 million)							
Total Asset Turnover Rate (times)	≥1.2	[0.85,1.2)	[0.6,0.85)	[0.25,0.6)	[0.06,0.25)	[0.01,0.06)	<0.01
Asset-Liability Ratio (%)	<25	[25,40)	[40,50)	[50,65)	[65,70)	[70,80)	≥80
EBITDA Interest Coverage (times)	≥25	[9,25)	[6.5,9)	[3.5,6.5)	[2.2,3.5)	[1,2.2)	<1
Quick Ratio (times)	≥3	[1.5,3)	[1,1.5)	[0.7,1)	[0.45,0.7)	[0.3,0.45)	<0.3
Net Cash Flow from Operating Activities (CFO)/Short-term Interest-bearing Debt (%)	≥100	[45,100)	[25,45)	[5,25)	[-10,5)	[-50,-10)	<-50
Net Profit Rate of Total Assets (%)	≥7	[4.25,7)	[2.5,4.25)	[1,2.5)	[0,1)	[2.5,0)	<2.5
Total Operating Revenue Growth Rate (%)	≥55	[20,55)	[5,20)	[-10,5)	[-20,-10)	[-30,-20)	<-30
Total Profit (100 million)	≥120	[40,120)	[20,40)	[5,20)	[1,5)	[-10,1)	<-10

Note: In the table above, when the net assets (100 million), total operating revenue (100 million), and total profit (100 million) indicators are converted to US dollars, all relevant data is divided by the foreign exchange conversion rate (USD/RMB=7.0827) on December 29, 2023, which is authorized by the People's Bank of China (central bank) and published by the China Foreign Exchange Trade System, designated by the State Administration of Foreign Exchange as the foreign exchange conversion rate.

(3) Pre-SRAF Rating Level Mapping

According to the previously mentioned indicators and weights for macro and regional strength and industry risk, a mapping level for "Regional Strength and Industry Risk" can be obtained. Similarly, based on the indicators and weights for corporate strength, operational risk, solvency, corporate financial risk, and corporate profitability, a mapping level for "Operational and Financial Risk" can be determined.

Combining the mapping levels of the two dimensions, ARHK can derive a two-dimensional matrix Pre-SRAF rating level mapping for manufacturing enterprises using the Pre-SRAF rating level two-dimensional matrix.

The Pre-SRAF rating level mapping is as follows:

Pre-SRAF Rating Level		Regional Strength and Risk						
		7	6	5	4	3	2	1
Operational and Financial Risk	7	aaa	aaa/aa+	aa+/aa	aa/aa-	aa-/a+	a+/a	a-/bbb+
	6	aaa/aa+	aa+/aa	aa/aa-	aa-/a+	a+/a	a-/bbb+	bbb/bbb-
	5	aa+/aa	aa/aa-	aa-/a+	a+/a	a/a-	bbb+/bbb	bbb-/bb+
	4	aa/aa-	aa-/a+	a+/a	a/a-	a-/bbb+	bbb/bbb-	bb+/bb
	3	aa-/a+	a+/a	a/a-	a-/bbb+	bbb/bbb-	bb+/bb	bb-/b+
	2	a/a-	a-/bbb+	bbb+/bbb	bbb/bbb-	bb+/bb	bb-/b+	b/b-
	1	a-/bbb+	bbb+/bbb	bbb/bbb-	bb+/bb	bb-/b+	b/b-	Below ccc

2. Sovereign Risk Adjustment Factors

Sovereign risk adjustment factors are important considerations when conducting international credit ratings for the rated entity. ARHK uses " Political Risk," " Social Risk," "Foreign Exchange Control Risk," " Bank Operational Risk," " Local Currency Devaluation Risk," " Debt Crisis," "Financial Market Volatility Risk," and " Other Factors" as sovereign risk adjustment factors to adjust the international credit of manufacturing enterprises, resulting in the international rating benchmark for the rated entity. Given the numerous factors affecting sovereign credit risk, which are dynamically changing with international relations, economy, and industry development, the sovereign credit risk adjustment items listed in this method may not cover all adjustment elements and require continuous accumulation, summarization, and optimization in rating.

(1) Political Risk

If the rated entity has significant domestic political risk and geopolitical risk, its credit rating may be downgraded.

(2) Social Risk

If the rated entity has significant social conflicts, ethnic conflicts, cultural or religious conflicts, its credit rating may be downgraded.

(3) Foreign Exchange Control Risk

If the rated entity has significant risk of restricted capital flow, its credit rating may be downgraded.

(4) Bank Operation Risk

If the rated entity has significant risk of not being able to exchange funds timely, its credit rating may be downgraded.

(5) Local Currency Devaluation Risk

If the rated entity has significant local currency devaluation risk, its credit rating may be downgraded.

(6) Debt Crisis

If the rated entity has significant international external debt crisis, its credit rating may be downgraded.

(7) Financial Market Volatility Risk

If the rated entity has significant international financial market volatility risk, its credit rating may be downgraded.

(8) Other Factors

Other factors refer to all sovereign factors beyond the aforementioned that may affect a bank's debt repayment ability and willingness. ARHK will make appropriate adjustments to its credit rating based on specific circumstances.

Specific sovereign risk adjustment factors are as follows:

Primary Factor	Secondary Factor
Political Risk	Domestic Political Risk
	Geopolitical Risk
Social Risk	Social Conflicts

Primary Factor	Secondary Factor
	Ethnic Conflicts
	Cultural or Religious Conflicts
Foreign Exchange Control Risk	Restricted Capital Flow
Bank Operation Risk	Operation Risk
Local Currency Devaluation Risk	Local Currency Devaluation Risk
Debt Crisis	Debt Crisis
Financial Market Volatility Risk	Financial Market Volatility Risk
Other Factors	Other Factors

3. Rating Criteria

ARHK derives the rating benchmark for the rated entity based on the Pre-SRAF rating level and sovereign risk adjustment factors.

4. Self-adjustment Factors

Self-adjustment is a supplementary analysis based on the evaluation of common characteristics of manufacturing enterprises, targeting the unique characteristic elements of the evaluated manufacturing enterprise. The evaluation result after individual characteristic adjustment is the basic credit rating that can fully reflect the manufacturing enterprise's own credit level. It is worth noting that only factors that impact the credit risk of manufacturing enterprises and occur only in individual manufacturing enterprises will be considered in the adjustment items. ARHK uses self-adjustment factors such as "ESG", "Business Risk", "Financial Information Quality Risk", "Asset Quality Risk", "Short-Term Liquidity Risk", "Bad Credit Record", "Significant Negative Public Opinion", "Contingent Risk", "Mergers and Acquisitions", and "Other Factors" to adjust urban investment enterprises. Due to the numerous factors affecting credit risk and their dynamic changes with economic and industry development, the adjustment items listed in this method may not cover all adjustment elements, requiring continuous accumulation, summarization, and optimization in the practice of rating work.

(1) ESG

ESG is the abbreviation for Environment, Social Responsibility, and Corporate Governance, which are important factors influencing the sustainable business development potential of the evaluated entity. If the evaluated entity performs poorly in ESG aspects, it may affect the

stability of its production operations and financial performance, thereby increasing the credit risk of the evaluated entity. ARHK focuses on the negative impacts of various ESG factors. If the evaluated entity has relevant risk factors, its credit rating may be adjusted.

(2) Business Risk

If the rated entity has business transformation risk, business cycle fluctuation risk, concentration risk, commercial foreign exchange risk, international trade friction risk, or business interruption risk, its credit rating may be downgraded.

(3) Financial Information Quality Risk

Financial information is the basis for evaluating the financial risk of the rated entity. In evaluating financial risk, attention should be paid to whether the audit conclusion of the financial report is not an "Unqualified opinion" (similar situation if it is an international audit report); whether there are significant financial risks not reflected in the consolidated statements; whether the financial data is distorted. If negative, its credit rating may be downgraded.

(4) Asset Quality Risk

Entities with large-scale receivables for a single item, substantial restricted assets with legal disputes, asset change risks, or risks of waiving others' debts may face a downgrade in their credit rating.

(5) Short-term Liquidity Risk

If an entity faces short-term liquidity risks that could affect its medium and long-term credit status, a downgrade in credit rating may be warranted.

(6) Bad Credit Record

Entities with bad credit records, such as overdue debts or other records of dishonesty, may experience a downgrade in their credit rating.

(7) Significant Negative Public Opinion

Entities experiencing significant negative public opinion, where the impact hasn't been mitigated, may see a downgrade in their credit rating.

(8) Contingent Risk

Entities with significant litigation risk or high guarantee (joint liability guarantee) compensation risk may face a downgrade in their credit rating.

(9) Mergers and Acquisitions

Entities undergoing significant mergers and acquisitions with substantial investment may have their credit rating appropriately downgraded.

(10) Other Factors

Other factors refer to elements beyond those mentioned that could affect a manufacturing enterprise's ability and willingness to repay debts. ARHK will make necessary adjustments to the credit rating based on specific circumstances.

The specific self-adjustment factors are as follows:

Primary Factor	Secondary Factor
ESG	E
	S
	G
Business Risk	Business Transformation Risk
	Business Cycle Fluctuation Risk
	Concentration Risk
	Commercial Foreign Exchange Risk
	International Trade Friction Risk
	Business Interruption Risk
Financial Information Quality Risk	Financial Information Quality
Asset Quality Risk	Receivables
	Asset Restriction Situation
	Asset Change Risk
	Waiving Others' Debts Risk
Short-term Liquidity Risk	Short-term Credit Risk
Bad Credit Record	Debt Overdue
	Other Dishonesty Records
Significant Negative Public Opinion	Significant Public Opinion Risk
Contingent Risk	Litigation Risk
	Guarantee (Joint Liability Guarantee) Compensation Risk

Primary Factor	Secondary Factor
Mergers and Acquisitions	Mergers and Acquisitions Risk
Other Factors	Other Factors

5. BCA Grade

ARHK derives the BCA grade for the rated entity based on the rating criteria and self-adjustment factors.

6. External Support

The external support adjustment factors are as follows:

Primary Factor	Secondary Factor
Government Support	Government Support Willingness
	Government Support Historical Record
Shareholder Support	Shareholder Support Willingness
	Shareholder Support Strength

If the evaluated entity can still obtain stable external support when facing a liquidity crisis and having difficulty fulfilling debt commitments, it will help stabilize the expectations of relevant parties, thereby reducing the likelihood of the evaluated entity experiencing an actual liquidity crisis. At the same time, the specific rescue measures taken by external supporters when the evaluated entity encounters an operational or liquidity crisis will help increase the likelihood of debt repayment at maturity or reduce the default loss rate.

Manufacturing enterprises usually obtain external support from the government and shareholders. ARHK mainly considers the external support obtained by manufacturing enterprises from two aspects: government support and shareholder support.

(1) Government Support

ARHK mainly focuses on the position and importance of the rated manufacturing enterprise in local government decision-making and local economic development, as well as the actual situation and specific support methods historically obtained, such as capital injection, financial subsidies, or tax incentives. In considering government support for manufacturing enterprises, ARHK mainly considers two dimensions: government support willingness and government

support history. Based on a comprehensive evaluation of these two dimensions, the extent of government support obtained by the rated entity is derived. In terms of government support willingness, ARHK mainly considers the following aspects: first, the proportion of shares held by the government and its investment representative in the rated entity; second, the business support provided by the government to the rated entity; third, the government's control over the rated entity.

Government support history mainly considers the magnitude of support received from the government (general support or special support).

The mapping of government support is as follows:

Government Support		Government Support Willingness		
		3	2	1
Government Support Historical Record	3	3/2	2/1	1/0
	2	2/1	1/0	0
	1	1/0	0	0

(2) Shareholder Support

Shareholder support for manufacturing enterprises considers two dimensions, which are shareholder support willingness and shareholder support strength. Based on a comprehensive evaluation of these two dimensions, the extent of shareholder support obtained by the rated entity is derived.

In terms of shareholder support willingness, ARHK mainly considers the following aspects: the proportion of shares held by shareholders in the rated entity; the position of the rated entity in the shareholder's business layout; the contribution of the rated entity to the shareholder in terms of assets, income, and profit; the joint guarantee legal relationship with the shareholder; the impact of the rated entity's default on the shareholder.

Shareholder support strength mainly considers the current support strength of shareholders and the historical record of shareholder support.

Shareholder support mapping is as follows:

Shareholder Support		Shareholder Support Willingness		
		3	2	1
Shareholder Support Strength	3	3/2	2/1	1/0
	2	2/1	1/0	0
	1	1/0	0	0

7. Final Credit Rating

Based on the BCA rating of the rated entity, ARHK considers external support to derive the rated entity's credit rating (Model Result Grade).

The final credit rating obtained through this methodology and model serves as a reference credit rating for the rated entity, only as a reference for the analyst's recommended credit rating and the credit rating committee's evaluation of the credit rating. The final credit rating is determined by the credit rating committee, and there may be differences between the Final Credit Rating and the Model Result Grade.

VI. Limitations of this methodology and model

1. ARHK bases its judgment of various rating elements for such companies on their historical operational conditions. However, the impact of relevant elements and their future development on debt repayment ability may vary due to changes in the external environment. Therefore, this methodology and model cannot guarantee an accurate prediction of the actual future default risk of such companies.

2. This methodology and model only list the key rating elements that need to be examined when rating such companies and do not cover all elements that need to be considered when evaluating the credit risk of such companies.

3. There are human factors in the selection of indicators in this methodology and model. The weight of elements in the rating model represents the relative importance of artificially assessed rating elements. The rating model contains critical qualitative assessment factors, which may lead to this rating methodology and model not being able to fully and accurately reflect credit risk. At the same time, each member of the credit rating committee may consider more factors beyond the scope of the rating methodology and model when making their own judgment conclusions. Therefore, the final determination of the credit rating always contains subjective influences. ARHK will periodically or irregularly review and revise this methodology and model as appropriate.

Appendix:

Indicator Calculation Formulas

1. Asset-Liability Ratio = Total Liabilities / Total Assets × 100%

2. Total Asset Turnover Ratio= Operating Income × 2 / (Total Assets at Year-End + Total Assets at Previous Year-End)

3. Short-Term Interest-Bearing Debt = Short-Term Loans + Notes Payable + Other Current Liabilities (Interest-Bearing Items) + Non-Current Liabilities Due Within One Year + Other Payables (Interest-Bearing Items) + Other Current Liabilities (Interest-Bearing Items)

4. Long-Term Interest-Bearing Debt = Long-Term Loans + Bonds Payable + Long-Term Payables (Interest-Bearing Items) + Lease Liabilities + Other Non-Current Liabilities (Interest-Bearing Items) + Other Non-Current Liabilities (Interest-Bearing Items)

5. Interest-Bearing Debt = Short-Term Interest-Bearing Debt + Long-Term Interest-Bearing Debt

6. EBIT = Total Profit + Interest Expense Included in Financial Expenses

7. EBITDA = EBIT + Depreciation + Amortization (Intangible Asset Amortization + Long-Term Deferred Expense Amortization)

8. EBITDA Interest Coverage Ratio (Times) = EBITDA / Interest Expense (Interest Expense = Interest Expense Included in Financial Expenses + Capitalized Interest Expense)

9. Quick Ratio = (Current Assets - Inventory) / Current Liabilities

10. Return on Total Assets = Net Profit × 2 / (Total Assets at Year-End + Total Assets at Previous Year-End) × 100%

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